

REMARKS

The Examiner provides a number of rejections that are addressed in the order as listed below.

- I. Claim Rejections Under 35 USC §112 ¶1.
 - A. Claims 1-20 are rejected as allegedly failing to comply with the written description requirement.
 - B. Claims 1-20 are rejected as allegedly failing to comply with the enablement requirement.
- II. Claim Rejections Under 35 USC §112 ¶2.
 - A. Claim 13 is rejected as allegedly being indefinite.
- III. The Examiner objects to Claims 4, 12, and 16 for allegedly being in improper dependent form.

I. The Claims Comply With 35 USC §112

A. Claims 1-20 Have Adequate Written Description

1. Biomolecules Are Sufficiently Described

The Examiner states that "...the record does not provide a full, clear, and concise description of the claimed invention, including the genus of "organic material[s]" ... *Office Action* pg 4 ¶ 8. The Applicants disagree. The Applicants point out that the Examiner's reliance on *University of Rochester v. Searle* is misplaced. The claims at issue in *Rochester* are directed to methods of detecting protein inhibitor compounds. Device and system claims are pending in the present application, not method claims.

Nonetheless, without acquiescing to the Examiner's argument but to further the prosecution, and hereby expressly reserving the right to prosecute the original (or similar) claims, Applicants have amended Claim 9 and Claim 10 to recite "biomolecules" instead of "organic material". These amendments are made not to acquiesce to the Examiner's argument but only to further the Applicants' business interests, better define one embodiment and expedite the prosecution of this application. The Examiner is requested to note that the term "biomolecule" is fully and clearly defined in the Applicants' Specification as follows:

... biomolecules such as enzymes (e.g., polymerases, nucleases, etc.) and nucleic acids (both RNA and DNA) ... [and] ... proteins, lipids ... *pg 8 ln 7 – 9.*

2. Aluminum Layers Are Sufficiently Described

The Examiner states that "... the device may comprise a layer of aluminum ... Said layer is without limits and as such has been construed as encompassing virtually any thickness" and that "... the array of heating elements can be made of virtually any material ...". *Office Action* pg 4 ¶ 9. The Applicants disagree and argue that the Examiner is not interpreting the claims in light of the specification's teachings.¹ There are several places within the Applicants' Specification that discuss aluminum heating element thicknesses, for example:

Aluminum was deposited (0.35 μm) across the entire wafer using electron beam evaporation ... *pg 18 ln 24-25*.

and,

The etch depth was measured by profilometer and 0.35 μm metallic aluminum was electron beam deposited. *pg 19 ln 9-11*.

and,

The individual heater consists of paired aluminum wires (5 μm) winding across the 500 μm wide region. ... The width of the aluminum element is 5 μm . *pg. 19 ln 18-21*.

Nonetheless, without acquiescing to the Examiner's argument but to further the prosecution, and hereby expressly reserving the right to prosecute the original (or similar) claims, Applicants have amended Claims 1, 8, and 13 to recite that the heating elements are "etched aluminum". Claims 2 and 14 are concomitantly canceled. These amendments are made not to acquiesce to the Examiner's argument but only to further the Applicants' business interests, better define one embodiment and expedite the prosecution of this application.

B. Claims 1-20 Are Enabled

The Examiner rejects Claims 1, 2, 4, 6-14, and 18-20 because these claims "... have been construed as encompassing an embodiment where a layer of silicon oxide effectively overlays, or covers aluminum heating elements". *Office Action* pg 6 ¶ 13. The Applicants disagree. Nonetheless, without acquiescing to the Examiner's argument but to further the prosecution, and hereby expressly reserving the right to prosecute the original (or similar) claims, Applicants have amended Claims 1, 8, and 13 to recite that the channels comprise "a first silicon layer, a silicon nitride layer, and a second silicon oxide layer". Claims 5 and 17 are, therefore, concomitantly canceled. Claim 1 is further amended to recite that a barrier layer is positioned on top of the channel. These amendments are made not to acquiesce to the Examiner's argument but only to

¹ "Claims of a patent application 'are to be construed in the light of the specification and the understanding thereof by those skilled in that art to whom they are addressed'." *Application of Salem*, 553 F.2d 676, 683, 193 USPQ 513 (CCPA 1977) (quoting *In re Myers*, 410 F.2d 420, 425 (CCPA 1969) with emphasis added in *Salem*)

further the Applicants' business interests, better define one embodiment and expedite the prosecution of this application. The Examiner is requested to note the addition of new Claims 21 – 25, wherein the embodiment describes “a barrier that is impermeable to an aqueous solution”. This embodiment finds support within the specification, for example, at pg 18 ln 26-28 and pg 31 ln 15-17.

The Examiner states that, in regards to Example 5, “... the specification does not identify any nucleic acid being amplified, much less the reaction conditions”. *Office Action* pg 6 ¶ 12. The Applicants disagree and remind the Examiner that U.S. Patent No.'s 4,683,195 and 4,683,202 to Mullis *et al.* are incorporated by reference within the instant application. See *Applicants' Specification* pg 9 ln 28-29. These two patents contain both nucleic acid sequences and reaction conditions that enable PCR experiments. Further, the Applicants provide a lengthy discussion of the PCR process. See *Applicants' Specification* pg 10 ln 1 – 15.

The Examiner states that “The specification fails to set forth a reproducible procedure whereby one can detect an analyte of interest when the device/system already comprises the intended target”. *Office Action* pg 7 ¶ 15. The Examiner further states that “The specification does not set forth reaction conditions and starting materials required to enable the use of the claimed invention”. *Office Action* pg. 7 ¶ 16. The Applicants point out that Claims 1-20 recite device and system claims, not method claims. Consequently, this aspect of the Examiner's rejection rationale is irrelevant to the presently claimed embodiment.

II. The Claims Are Definite

The Examiner states that Claim 13 is indefinite because there is insufficient antecedent basis for the limitation “said fluid transport channel”. *Office Action* pg 2 ¶ 4. The Applicants believe that one having ordinary skill in the art would understand that a fluid transport channel is consistent with a microdroplet transport channel. Nonetheless, without acquiescing to the Examiner's argument but to further the prosecution, and hereby expressly reserving the right to prosecute the original (or similar) claims, Applicants have amended Claim 13 to recite “microdroplet” instead of “fluid”. This amendment is made not to acquiesce to the Examiner's argument but only to further the Applicants' business interests, better define one embodiment and expedite the prosecution of this application.

III. The Claims Are Not Improperly Dependent


The Examiner objects to Claims 4, 12, and 16 for not further limiting the subject matter of a previous claim. *Office Action* pg 2 ¶ 1. The Applicants disagree. Nonetheless, without acquiescing to the Examiner's argument but to further the prosecution, and hereby expressly reserving the right to prosecute the original (or similar) claims, Applicants have canceled Claims

2, 12, and 16. These amendments are made not to acquiesce to the Examiner's argument but only to further the Applicants' business interests, better define one embodiment and expedite the prosecution of this application.

CONCLUSION

The Applicants believe that the arguments and claim amendments set forth above traverse the Examiner's rejections and, therefore, request that all grounds for rejection be withdrawn for the reasons set above. Should the Examiner believe that a telephone interview would aid in the prosecution of this application, the Applicants encourage the Examiner to call the undersigned collect at 617.984.0616.

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Peter G. Carroll
Registration No. 32,837

MEDLEN & CARROLL, LLP
101 Howard Street, Suite 350
San Francisco, California 94105
617.984.0616